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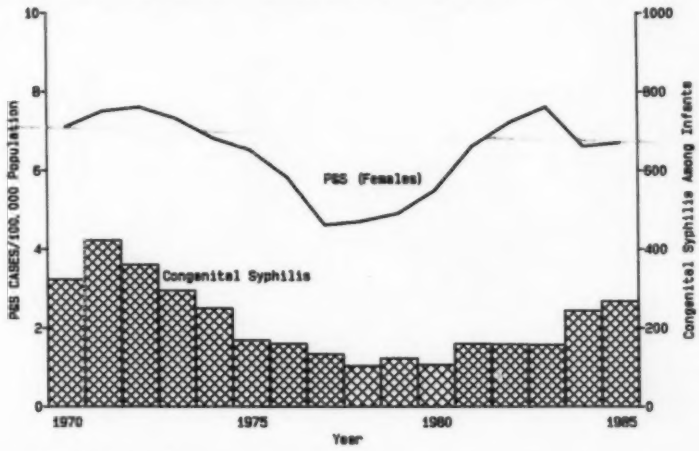
Current Trends

Congenital Syphilis — United States, 1983-1985

After 8 years of steady decline, the number of reported cases of congenital syphilis (CS) among persons under 1 year of age rose in the period 1978-1985 from 108 to 268 (Figure 1). Incidence of CS generally reflects incidence of primary and secondary (P & S) syphilis among women of childbearing age, as well as the diagnosis and treatment of syphilis in prenatal care programs. In 1985, rates of CS were highest in areas with high incidence of P & S syphilis (*1*) (Figure 2). Three states (Texas, Florida, California) and one major metropolitan area (New York City) accounted for 80% of all CS cases reported in 1985. Between 1978 and 1983, P & S syphilis rates for women also increased to a peak of 7.6 cases/100,000 women in 1983 (Figure 1).

In 1983, CDC surveillance of CS was modified to enable the reporting of detailed clinical data on affected infants and their mothers to the Division of Sexually Transmitted Diseases, CDC. On the basis of these data, reporting areas classified CS cases among patients less than

FIGURE 1. Case rates of primary and secondary (P&S) syphilis among females and congenital syphilis among infants* — United States, 1970-1985



*Under 1 year of age

Congenital Syphilis — Continued

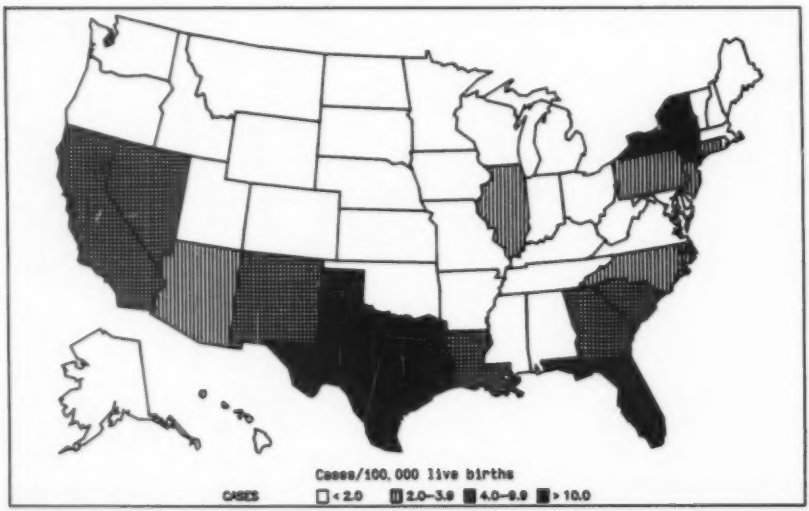
1 year of age by a modification of previously published criteria (2) as "definite," "probable," "possible," and "unlikely." This information for the period 1983-1985 was used to explore what factors could be associated with the trend toward rising incidence.

Clinical data and certainty of diagnosis are available for 460 patients (111 cases reported in 1983, 209 in 1984, and 140 in 1985). Fifty (11%) patients with clinical information had dark-field-proven "definite" CS, and 191 (42%) were classified as having "probable" CS on the basis of rising serologic titers prior to treatment, persistently positive treponemal tests at 6 months of age, or major clinical manifestations. Of these patients, 10 were seronegative at birth, but each was retested when the mother was seen for secondary syphilis during the child's infancy. One hundred ninety-six (43%) were classified as having "possible" CS on the basis of minor clinical criteria and positive serologic testing. Six of the infants tested were considered to have a low risk of infection ("unlikely" CS) because the mothers had adequate treatment during their pregnancy and the infants were asymptomatic at birth. For 17 (4%), insufficient data existed to establish the certainty of diagnosis.

Of the 460 case-infants, 238 (52%) were black; 167 (36%), Hispanic; 40 (9%), white; 15 (3%), other or unknown race. The mean age of case-infants at the time of reporting was 2.1 months; 276 (60%) were reported as having CS in the first 30 days after birth.

Stillbirth in the presence of maternal early syphilis was the initial symptom prompting evaluation for 21 (19%) of the infants reported in 1983, for 74 (35%) of the infants reported in 1984, and 40 (29%) of the infants reported in 1985. In 30% of reported cases in all three of these years, infants were born with symptoms suggestive of CS. Only 12% of infants were asymptomatic at birth and diagnosed solely because of a positive maternal delivery serologic test for syphilis (STS).

FIGURE 2. Congenital syphilis rates*, by state — United States, 1985



*Excludes known stillbirths

Congenital Syphilis — Continued

Osteochondritis and periostitis were the most common major signs of CS in this series. Jaundice, hepatosplenomegaly, and cutaneous lesions were the most frequently cited minor (non-specific) signs of CS. Clinically significant central nervous system involvement was identified in 34 cases, but only five infants had cerebrospinal fluid serologic evidence of neurosyphilis.

Demographic characteristics of mothers of infants with CS did not change appreciably over the 3 years studied. The mean age for a mother at the time of birth of the infected infant was 24 years (range, 14-43 years); 133 (30%) mothers were under 20 years of age.

In the general population, 95% of pregnant women have at least one prenatal medical visit (*3*); in contrast, only 52% of mothers of infants with CS reported having at least one prenatal visit (Table 1). Among those mothers receiving prenatal care, the mean gestational age at which they were first seen for prenatal care was 22 weeks—i.e., late in the second trimester.

Preventable failure to diagnose or treat infected mothers who did receive prenatal care contributed to the occurrence of CS. Of women who received prenatal care, CS cases were attributed to failure to screen for syphilis (18 women, 8%); failure to treat pregnant women with reactive STS (32 women, 14%); and failure to screen women in the third trimester of pregnancy who lived in an area of high CS prevalence (58 women, 25%) (Table 1).

Of the 229 women who received prenatal care, 81 (35%) were treated for syphilis during their pregnancies but later had infants with CS (Table 1). Sixty of these treatment failures occurred among women who had been treated with benzathine penicillin regimens appropriate for their stage of infection; 45 of these were in the third trimester and another 11 in the second trimester. In three of the second-trimester treatment failures, a reinfection was documented in the third trimester. Thirty-five percent of the treatment failures occurred among mothers who were treated during the P & S stages of syphilis and later had infected infants. Of the untreated group, only 24% were in the P & S stages of syphilis at the time of diagnosis. Erythromycin oral regimens used for pregnant patients who reported a penicillin allergy accounted for 11 of the 81 treatment failures.

TABLE 1. Clinical factors associated with congenital syphilis (CS) among 437 infants* — United States, 1983-1985

Factor	Number of infants	(%)
Did receive prenatal care	**229**	**(52)**
No STS	18	(8)
Positive STS not treated	32	(14)
Negative 1st STS; no 3rd trimester STS	58	(25)
Other causes for failure to diagnose	40	(18)
Prenatal antibiotic treatment failure†	81	(35)
Did not receive prenatal care	**208**	**(48)**

*Excludes 23 infants unlikely to have CS or with insufficient data to determine certainty of diagnosis.

†Antibiotic regimen	Number of infants	(%)
3rd trimester benzathine penicillin	45	(55)
2nd trimester benzathine penicillin	11	(14)
Benzathine penicillin, trimester unknown	4	(5)
Erythromycin	11	(14)
Other antibiotic treatments	10	(12)

Source: CDC Congenital Syphilis Follow-Up Form 73.126, 1983-1985.

Congenital Syphilis – Continued

Reported by Epidemiology Research Br, Evaluation and Statistical Svcs Br, Div of Sexually Transmitted Diseases, Center for Prevention Svcs, CDC.

Editorial note: Steady decreases in incidence of CS occurred following the introduction of benzathine penicillin therapy in the 1950s and prenatal serologic screening for syphilis (*4*). However, substantial increases in reported cases have been observed in recent years.

Part of the increase observed in 1984 may be attributed to increased sensitivity of the surveillance system—particularly for stillbirths. However, there is no trend to suggest that the increase observed in 1985 is attributable to any change in reporting activity. The recent increases in CS incidence suggest that increased vertical transmission may be related to underutilization and inadequacy of prenatal care. With high rates of P & S syphilis still existing in some areas in the United States, it is particularly important to provide early, high-quality prenatal care to populations in these areas, with serologic testing in both the first and third trimester (*5*) and adequate follow-up to detect reinfection and treatment failure.

Clinical data on confirmed CS cases in the series reported on here suggest that at least 60% of cases could have been prevented if the above recommendations had been implemented. The resources required for accessible, high-quality early prenatal care to adequately screen pregnant women for syphilis are considerable. However, even in female populations with very low prevalence of early syphilis, prevention in the prenatal care setting is cost-effective (*6*).

Complete reporting of those infants who may be infected is essential to the surveillance and ultimately the prevention of CS. The data indicate that CS cases are being reported very shortly after birth, underscoring the timeliness of the surveillance system. When mothers develop symptoms of syphilis within 12 months after their babies are born, the infants should be evaluated even if they were seronegative at birth (*2*).

Failure of recommended prenatal antibiotic treatment regimens resulted in 19% of the confirmed CS cases in this series. Of these, third-trimester treatments and erythromycin treatment due to maternal penicillin allergies accounted for 69% of failures. Erythromycin treatment during pregnancy has been associated with numerous reports of treatment failure (*7,8*). For pregnant women who are allergic to penicillin, oral desensitization after documentation of penicillin allergy represents a promising alternative (*9*). Further evaluation of treatment failures during P & S stages of syphilis, as well as during the third trimester, is under way to determine the adequacy of current recommendations and to provide guidelines for theoretical alternative antibiotic regimens.

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Epidemiologic Notes and Reports

Group-A, -B Hemolytic *Streptococcus* Skin Infections in a Meat-Packing Plant — Oregon

In the period October 17, 1985-January 9, 1986, 44 episodes of pyoderma occurred among 32 workers in an Oregon meat-packing plant. Most of the 44 reports involved impetigo-like lesions on the hand, wrist, and forearm, but six episodes of cellulitis and two of lymphangitis were also reported. The same epidemic strain of Group-A, -B hemolytic *Streptococcus* (GAS) isolated from skin lesions was also isolated from meat in the plant.

In November 1985, emergency-room personnel in Pendleton, Oregon, reported to the Umatilla County Health Department a cluster of skin infections affecting three employees in a meat-packing plant, all from the same small, family-owned facility. After the Oregon State Health Division was asked to investigate, all 69 persons employed in the plant were interviewed for a history of and examined for the presence of pustular, draining, or inflamed skin lesions.

Seventy lesions were cultured, representing the initial 44 episodes of infection and 14 later sporadic cases. GAS, only, was isolated from 26%; both GAS and *Staphylococcus aureus* from 54%; and *Staph. aureus*, only, from 17%. Whereas multiple phage types of *Staph. aureus* were isolated from patients and meat, a single strain of GAS, MNT T14 SOR$^+$, was identified in 24 group A streptococcal isolates serotyped.

Between October 17, 1985, and January 9, 1986, all but four of the 32 ill meat packers worked at least part-time on the kill floor or on the boning line or both. The attack rate for boners/killers was 74%, compared with 13% for workers who were never involved in killing or boning (relative risk [RR]=5.7, 95% confidence limits [CL]=2.9-11.3).

The epidemic investigation suggested that meat was a vehicle of transmission of GAS between workers. Cultures of two pork loins revealed the same epidemic strain (MNT T14 SOR$^+$) as did isolates from patients. An increased risk for acquiring infection could not be shown for other exposures. Workers who became infected did not share knives or gloves more often than did uninfected workers. Meat packers usually own and maintain their own knives.

Recommendations to the meat-packing plant included an increased emphasis on worker safety; an increased emphasis on worker hygiene, e.g., covering skin lacerations; removal of workers with untreated skin infections from the meat-processing line; and improved surveillance of skin injuries and infections, including modifying sick-leave benefits to encourage reporting.

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Editorial Note: This is the second reported outbreak of GAS skin infections among U.S. meat packers. During a similar outbreak in a Vermont meat-packing plant involving 18 of 59 employees, a worker with a chronic impetiginous lesion may have introduced GAS into the plant, and meat was postulated as one mode of transmission (*1*). Epidemic and sporadic cases of GAS skin infections among meat workers have been recognized in Great Britain since the mid-1970s (*2-4*). In the Oregon outbreak, it is also likely that meat was the vehicle of transmission after initial contamination by an infected human. Knife use is probably the significant risk shared by killers and boners vs. other meat workers. Bone has also been recognized

Streptococcus *Skin Infections — Continued*

as a source of skin injury among meat workers (*5*). GAS might spread from a meat-packing plant outside to non-plant workers, although there is no evidence of such transmission in the Oregon outbreak. In Great Britain, retail butchers and restaurant workers have been infected with epidemic GAS strains during outbreaks in meat-packing plants, presumably by handling contaminated meat (*6, 7*). Improved surveillance of skin infections in the meat-packing industry may document more accurately the occurrence of such outbreaks in the United States.

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TABLE I. Summary—cases specified notifiable diseases, United States

Disease	40th Week Ending			Cumulative, 40th Week Ending		
	Oct. 4, 1986	Oct. 5, 1985	Median 1981-1985	Oct. 4, 1986	Oct. 5, 1985	Median 1981-1985
Acquired Immunodeficiency Syndrome (AIDS)	345	218	N	9,910	5,998	N
Aseptic meningitis	383	447	354	7,472	7,440	7,230
Encephalitis: Primary (arthropod-borne & unspec.)	32	56	48	889	952	1,146
Post-infectious	-	3	3	82	104	76
Gonorrhea: Civilian	17,043	18,881	19,021	670,113	681,409	691,825
Military	358	328	486	12,693	16,332	18,749
Hepatitis: Type A	492	515	496	16,871	17,038	17,038
Type B	494	544	482	19,596	19,785	18,296
Non A, Non B	57	76	N	2,667	3,179	N
Unspecified	75	127	157	3,448	4,393	5,556
Legionellosis	23	21	N	539	574	N
Leprosy	5	5	4	194	291	193
Malaria	25	19	19	847	801	801
Measles: Total*	87	14	20	5,559	2,522	2,349
Indigenous	79	13	N	5,281	2,096	N
Imported	8	1	N	278	426	N
Meningococcal infections: Total	26	40	40	1,928	1,853	2,146
Civilian	26	40	40	1,926	1,847	2,142
Military	-	-	-	2	6	11
Mumps	262	30	41	3,889	2,335	2,573
Pertussis	175	134	50	2,601	2,517	1,866
Rubella (German measles)	6	6	11	429	566	804
Syphilis (Primary & Secondary): Civilian	447	534	617	20,109	20,613	23,508
Military	1	3	3	128	138	289
Toxic Shock syndrome	5	9	N	270	294	N
Tuberculosis	501	415	458	16,831	16,283	17,985
Tularemia	2	8	7	114	144	218
Typhoid fever	10	18	10	231	294	307
Typhus fever, tick-borne (RMSF)	19	24	13	647	607	889
Rabies, animal	86	102	102	4,233	4,176	4,896

TABLE II. Notifiable diseases of low frequency, United States

	Cum 1986		Cum 1986
Anthrax	-	Leptospirosis	27
Botulism: Foodborne (Alaska 1)	11	Plague	7
Infant	39	Poliomyelitis, Paralytic	1
Other	1	Psittacosis (Mich. 1)	77
Brucellosis (Ky. 1)	62	Rabies, human	-
Cholera	2	Tetanus	53
Congenital rubella syndrome	9	Trichinosis	30
Congenital syphilis, ages < 1 year	107	Typhus fever, flea-borne (endemic, murine) (Tex.1)	38
Diphtheria	-		

*Seven of the 87 reported cases for this week were imported from a foreign country or can be directly traceable to a known internationally imported case within two generations.

TABLE III. Cases of specified notifiable diseases, United States, weeks ending October 4, 1986 and October 5, 1985 (40th Week Ending)

Reporting Area	AIDS	Aseptic Menin-gitis	Encephalitis		Gonorrhea (Civilian)		Hepatitis (Viral), by type				Legionel-losis	Leprosy
			Primary	Post-in-fectious			A	B	NA,NB	Unspeci-fied		
	Cum 1986	1986	Cum 1986	Cum 1986	Cum 1986	Cum 1985	1986	1986	1986	1986	1986	Cum 1986
UNITED STATES	9,910	383	889	82	670,113	681,409	492	494	57	75	23	194
NEW ENGLAND	433	16	22	3	17,804	17,639	10	29	3	2	1	7
Maine	17	-	-	-	683	863	-	4	-	-	-	-
N H	10	5	2	-	436	431	-	-	-	-	-	-
Vt	4	3	4	2	200	258	-	1	-	-	-	-
Mass	237	3	5	-	6,853	7,134	2	15	3	2	1	7
R I	28	1	-	-	1,366	1,427	1	2	-	-	-	-
Conn	137	4	11	1	8,266	7,526	7	7	-	-	-	-
MID ATLANTIC	3,670	46	87	7	113,305	99,329	12	32	3	2	-	13
Upstate N Y	377	15	33	4	13,921	13,669	-	4	-	-	-	1
N Y City	2,474	5	18	-	64,102	49,236	-	-	-	1	-	11
N J	582	7	10	-	15,067	15,017	4	5	-	-	-	-
Pa	237	19	26	3	20,215	21,407	8	23	3	1	-	1
E N CENTRAL	614	65	264	11	86,160	90,620	22	66	1	4	7	5
Ohio	131	43	99	3	22,545	23,462	6	22	-	2	4	-
Ind	55	U	60	3	9,367	9,898	U	U	U	U	U	-
Ill	296	3	42	4	22,849	22,549	9	25	-	-	-	4
Mich	104	19	42	1	28,228	25,840	7	19	1	2	3	1
Wis	28	-	21	-	3,171	8,871	-	-	-	-	-	-
W N CENTRAL	193	22	60	9	28,999	31,587	13	25	1	1	6	3
Minn	72	-	24	-	4,154	4,698	1	3	-	-	1	1
Iowa	15	3	19	-	2,972	3,387	1	2	-	-	-	-
Mo	66	14	1	-	14,508	15,219	1	10	1	1	1	-
N Dak	2	-	3	-	251	215	-	-	-	-	-	-
S Dak	2	2	11	-	613	617	1	4	-	-	3	-
Nebr	8	1	-	1	2,233	2,689	3	-	-	-	1	-
Kans	28	2	2	8	4,268	4,762	6	6	-	-	-	2
S ATLANTIC	1,346	90	116	29	174,355	177,748	48	116	12	3	4	2
Del	19	1	6	-	2,878	3,387	2	1	-	-	-	-
Md	123	14	26	1	20,766	22,606	6	25	3	1	-	-
D C	172	1	-	1	13,104	11,904	1	1	-	-	-	-
Va	119	12	33	1	14,481	14,803	9	19	3	-	3	1
W Va	7	2	34	-	1,760	2,049	1	2	-	-	-	-
N C	58	8	15	1	26,909	27,599	2	11	1	1	-	-
S C	34	4	-	-	15,213	16,949	2	17	-	-	1	-
Ga	197	13	-	1	29,272	35,375	2	16	-	-	-	-
Fla	617	35	2	24	49,972	43,076	23	24	5	1	-	1
E S CENTRAL	112	49	56	4	54,519	57,430	4	21	4	4	-	1
Ky	25	3	27	1	8,044	6,676	1	8	3	-	-	-
Tenn	53	2	6	1	20,824	21,995	-	5	-	2	-	-
Ala	20	42	22	2	15,772	17,312	1	3	1	2	-	1
Miss	14	2	1	-	11,879	11,447	2	5	-	-	-	-
W S CENTRAL	740	32	128	6	79,546	85,800	56	40	4	22	3	19
Ark	24	1	-	2	7,277	8,327	1	9	1	-	-	1
La	123	1	6	-	14,199	16,501	-	3	-	-	-	-
Okla	27	5	19	-	9,159	9,543	3	1	1	4	-	1
Tex	566	25	103	4	48,911	51,429	52	27	2	18	3	17
MOUNTAIN	254	15	28	1	20,088	21,298	72	53	7	8	2	11
Mont	4	1	1	1	515	585	2	-	-	-	-	-
Idaho	3	-	-	-	664	718	8	-	1	1	-	-
Wyo	4	-	2	-	432	501	-	1	-	-	-	-
Colo	118	2	4	-	5,144	6,314	4	9	2	5	-	3
N Mex	20	-	3	-	2,155	2,442	18	9	-	-	1	-
Ariz	64	12	10	-	6,504	6,242	40	24	4	-	1	5
Utah	13	-	6	-	848	975	-	3	-	2	-	1
Nev	28	-	2	-	3,826	3,521	-	7	-	-	-	2
PACIFIC	2,548	48	128	12	95,337	99,958	255	112	22	29	-	133
Wash	119	-	11	-	6,953	7,727	15	9	1	-	-	15
Oreg	49	-	-	-	4,065	4,999	36	9	3	-	-	-
Calif	2,329	41	111	12	81,241	83,542	204	88	17	29	-	91
Alaska	11	-	6	-	2,077	2,323	-	2	-	-	-	-
Hawaii	40	7	-	-	1,001	1,367	-	4	1	-	-	27
Guam	-	-	-	-	151	180	-	-	-	-	-	1
P R	77	-	5	1	1,858	2,514	12	3	-	16	-	7
V I	3	U	-	-	188	348	U	U	U	U	U	-
Pac. Trust Terr	-	-	-	-	378	706	2	-	-	-	-	43
Amer Samoa	-	-	-	-	39	-	-	-	-	-	-	2

N: Not notifiable U: Unavailable

TABLE III. (Cont'd.) Cases of specified notifiable diseases, United States, weeks ending October 4, 1986 and October 5, 1985 (40th Week Ending)

Reporting Area	Malaria	Measles (Rubeola)					Menin-gococcal Infections	Mumps		Pertussis			Rubella		
		Indigenous		Imported *		Total									
	Cum 1986	1986	Cum 1986	1986	Cum 1986	Cum 1985	Cum 1986	1986	Cum 1986	1986	Cum 1986	Cum 1985	1986	Cum 1986	Cum 1985
UNITED STATES	847	79	5,281	8	278	2,522	1,928	262	3,889	175	2,601	2,517	6	429	566
NEW ENGLAND	55	-	82	-	15	126	133	-	53	1	125	142	-	9	12
Maine	2	-	12	-	1	1	25	-	-	-	2	9	-	-	-
N.H.	3	-	43	-	-	-	6	-	13	-	61	68	-	1	2
Vt.	1	-	-	-	-	-	16	-	3	-	3	3	-	1	-
Mass.	31	-	24	-	12	116	30	-	9	-	29	41	-	4	6
R.I.	7	-	2	-	-	-	18	-	9	1	6	14	-	2	-
Conn.	11	-	1	-	2	7	38	-	10	-	24	7	-	1	4
MID. ATLANTIC	110	-	1,672	4	33	212	312	2	171	11	169	162	-	32	219
Upstate N.Y.	41	-	77	-	23	85	103	-	56	2	106	87	-	24	17
N.Y. City	29	-	668	-	4	70	67	-	29	7	10	21	-	5	177
N.J.	20	-	905	4†§	4	28	30	1	41	2	17	7	-	3	11
Pa.	20	-	22	-	2	29	112	1	45	-	36	47	-	-	14
E.N. CENTRAL	53	-	1,030	-	28	530	282	218	2,660	11	317	619	1	44	32
Ohio	18	-	-	-	10	57	106	1	109	7	145	81	-	1	-
Ind.	2	U	19	U	11	57	24	U	34	U	26	188	U	-	1
Ill.	15	-	683	-	4	297	68	215	2,033	-	32	61	1	33	15
Mich.	17	-	59	-	-	60	57	2	289	4	32	41	-	8	15
Wis.	3	-	269	-	3	59	8	-	215	-	82	248	-	2	1
W.N. CENTRAL	24	-	322	-	17	11	91	4	95	90	403	176	1	13	19
Minn.	6	-	45	-	4	6	17	-	1	-	48	78	-	1	2
Iowa	1	-	133	-	1	-	11	2	29	1	19	28	-	1	1
Mo.	10	-	25	-	6	2	31	-	17	-	18	28	-	1	7
N. Dak.	-	-	25	-	1	2	-	-	3	-	4	9	-	1	2
S. Dak.	-	-	-	-	-	-	5	-	1	-	14	2	-	-	-
Nebr.	4	-	-	-	-	-	10	-	-	-	7	7	-	-	-
Kans.	3	-	94	-	5	1	17	2	44	89	293	24	1	9	7
S. ATLANTIC	104	68	626	-	56	314	346	9	194	10	686	453	-	12	51
Del.	1	-	1	-	-	-	3	-	-	-	227	1	-	-	1
Md.	14	-	26	-	9	105	44	1	18	-	159	283	-	-	6
D.C.	1	-	-	-	2	24	4	-	-	-	-	-	-	-	-
Va.	28	-	36	-	24	28	60	2	37	1	35	17	-	-	2
W. Va.	4	-	2	-	-	33	3	1	42	-	23	4	-	-	9
N.C.	5	-	3	-	1	9	58	3	19	3	66	24	-	-	1
S.C.	6	-	274	-	-	3	32	-	12	-	18	2	-	-	3
Ga.	10	-	79	-	14	8	51	-	28	-	122	85	-	-	-
Fla.	37	68	205	-	6	104	91	2	38	6	36	57	-	12	29
E.S. CENTRAL	18	-	58	-	9	7	107	2	32	1	45	48	-	4	3
Ky.	5	-	-	-	6	5	24	-	6	-	5	8	-	4	3
Tenn.	1	-	55	-	1	1	37	2	21	-	16	19	-	-	-
Ala.	8	-	1	-	1	-	33	-	4	-	23	17	-	-	-
Miss.	4	-	2	-	1	1	13	-	1	1	1	4	-	-	-
W.S. CENTRAL	89	-	604	-	38	431	172	8	170	22	216	346	1	63	34
Ark.	1	-	276	-	2	-	27	-	7	1	15	14	-	-	1
La.	16	-	4	-	-	42	23	-	3	-	13	12	-	-	-
Okla.	10	-	37	-	2	1	24	N	N	1	105	152	-	-	1
Tex.	61	-	287	-	34	388	98	8	160	20	83	168	1	63	32
MOUNTAIN	31	1	302	3	29	538	94	6	228	-	235	177	-	23	6
Mont.	-	-	-	-	8	137	8	-	5	-	14	9	-	2	-
Idaho	1	-	1	-	-	137	4	-	8	-	40	12	-	-	2
Wyo.	-	-	-	-	-	4	2	-	-	-	4	-	-	1	-
Colo.	8	-	2	3†	8	13	15	-	12	-	62	86	-	1	-
N. Mex.	5	-	33	-	7	6	9	N	N	-	20	11	-	-	2
Ariz.	11	-	252	-	6	241	21	6	184	-	56	34	-	2	1
Utah	3	-	12	-	-	-	9	-	13	-	35	45	-	14	-
Nev.	3	1	2	-	-	-	26	-	6	-	4	-	-	3	1
PACIFIC	364	10	585	1	53	353	411	13	286	29	406	394	3	229	190
Wash.	23	5	164	1†	26	83	56	2	10	23	137	67	-	15	14
Oreg.	15	-	7	-	4	5	31	N	N	-	12	40	-	1	1
Calif.	325	5	387	-	22	241	303	11	250	4	241	241	3	208	126
Alaska	-	-	-	-	-	-	12	-	6	-	2	29	-	-	1
Hawaii	1	-	27	-	1	24	9	-	20	2	13	17	-	5	48
Guam	1	-	4	-	1	11	-	-	4	-	-	-	-	3	2
P.R.	4	-	38	-	-	63	3	-	31	-	13	10	-	60	25
V.I.	-	U	-	U	-	10	-	U	14	U	-	-	U	-	-
Pac. Trust Terr.	-	-	-	-	-	-	1	1	11	-	-	-	-	2	-
Amer. Samoa	-	-	2	-	-	-	-	-	4	-	-	-	-	1	-

*For measles only, imported cases includes both out-of-state and international importations.

N: Not notifiable U: Unavailable †International §Out-of-state

TABLE III. (Cont'd.) Cases of specified notifiable diseases, United States, weeks ending October 4, 1986 and October 5, 1985 (40th Week Ending)

Reporting Area	Syphilis (Civilian) (Primary & Secondary)		Toxic-shock Syndrome	Tuberculosis		Tula-remia	Typhoid Fever	Typhus Fever (Tick-borne) (RMSF)	Rabies, Animal
	Cum 1986	Cum 1985	1986	Cum 1986	Cum 1985	Cum 1986	Cum 1986	Cum 1986	Cum 1986
UNITED STATES	20,109	20,613	5	16,831	16,263	114	231	647	4,233
NEW ENGLAND	359	454	-	543	548	1	13	12	7
Maine	15	13	-	33	40	-	-	-	-
N H	10	36	-	19	19	-	-	2	1
Vt	8	6	-	15	6	-	-	-	1
Mass	197	225	-	298	328	1	11	4	-
R I	18	14	-	40	42	-	-	3	3
Conn	111	160	-	138	113	-	2	3	2
MID ATLANTIC	2,890	2,771	-	3,380	2,971	1	20	31	523
Upstate N Y	148	211	-	474	523	-	3	19	65
N Y City	1,630	1,688	-	1,775	1,433	-	9	5	-
N J	506	538	-	580	400	1	7	2	16
Pa	606	334	-	551	615	-	1	5	442
E N CENTRAL	717	799	-	2,028	1,984	-	18	53	109
Ohio	99	115	-	354	352	-	4	48	9
Ind	87	71	U	215	246	-	2	-	16
Ill	351	381	-	859	864	-	3	2	33
Mich	139	182	-	505	408	-	7	3	23
Wis	41	50	-	95	114	-	2	-	28
W N CENTRAL	183	173	1	508	452	34	8	46	671
Minn	28	36	1	119	94	-	1	1	97
Iowa	6	17	-	42	48	1	-	1	151
Mo	88	89	-	252	221	28	6	33	66
N Dak	3	2	-	6	9	-	-	1	137
S Dak	6	5	-	23	22	2	-	6	141
Nebr	11	7	-	11	13	1	-	5	27
Kans	21	17	-	55	45	4	1	9	52
S ATLANTIC	6,042	6,046	-	3,271	3,284	9	39	302	1,015
Del	48	29	-	36	34	-	1	1	1
Md	333	367	-	237	278	2	14	28	496
D C	244	265	-	113	128	1	4	-	27
Va	278	226	-	273	287	2	8	44	149
W Va	18	18	-	97	87	-	3	8	37
N C	392	531	-	455	413	1	4	113	9
S C	534	631	-	424	409	-	-	70	53
Ga	1,159	1,063	-	530	556	3	-	36	162
Fla	3,036	2,916	-	1,106	1,092	-	5	2	81
E S CENTRAL	1,386	1,597	-	1,494	1,435	8	3	87	283
Ky	60	54	-	336	345	3	-	20	75
Tenn	476	490	-	441	413	4	1	39	108
Ala	423	496	-	469	433	1	1	16	98
Miss	427	557	-	248	244	-	1	12	2
W S CENTRAL	4,026	4,735	-	2,106	2,066	52	20	107	597
Ark	187	244	-	284	213	37	-	9	134
La	681	832	-	348	303	1	1	-	18
Okla	103	145	-	198	205	9	1	83	54
Tex	3,055	3,514	-	1,278	1,345	5	18	15	391
MOUNTAIN	460	558	2	393	418	7	14	8	577
Mont	6	6	-	24	46	1	1	4	183
Idaho	11	5	-	19	21	-	-	-	8
Wyo	2	7	-	-	5	-	-	1	242
Colo	106	141	-	34	50	3	1	3	29
N Mex	54	106	-	77	73	1	1	-	6
Ariz	195	251	-	186	185	-	7	-	96
Utah	16	5	2	28	12	1	3	-	5
Nev	70	37	-	25	26	1	1	-	9
PACIFIC	4,066	3,480	2	3,108	3,105	2	98	1	451
Wash	110	88	1	161	183	-	3	-	5
Oreg	88	79	-	104	103	-	-	-	-
Calif	3,842	3,259	1	2,665	2,593	1	88	1	438
Alaska	1	2	-	41	81	1	1	-	8
Hawaii	25	52	-	137	145	-	4	-	-
Guam	1	2	-	34	35	-	1	-	-
P R	699	651	-	271	291	-	5	-	36
V I	1	3	U	1	1	-	-	-	-
Pac. Trust Terr	211	100	-	58	61	-	46	-	-
Amer. Samoa	-	-	-	5	-	-	-	-	-

U: Unavailable

TABLE IV. Deaths in 121 U.S. cities,* week ending October 4, 1986 (40th Week)

Reporting Area	All Causes, By Age (Years)						P&I** Total
	All Ages	≥65	45-64	25-44	1-24	<1	
NEW ENGLAND	610	418	115	40	15	22	45
Boston, Mass.	179	108	43	13	3	12	19
Bridgeport, Conn.	47	34	7	5	1	-	3
Cambridge, Mass.	20	15	4	1	-	-	3
Fall River, Mass.	32	26	4	-	2	-	-
Hartford, Conn.	53	30	12	4	4	3	3
Lowell, Mass.	23	17	6	-	-	-	3
Lynn, Mass.	10	8	2	-	-	-	-
New Bedford, Mass.	25	18	3	3	1	-	1
New Haven, Conn.	42	28	9	4	1	-	1
Providence, R.I.	47	38	5	2	2	-	5
Somerville, Mass.	6	6	-	-	-	-	-
Springfield, Mass.	33	19	8	-	-	6	1
Waterbury, Conn.	34	29	1	3	-	1	2
Worcester, Mass.	59	42	11	5	1	-	4
MID ATLANTIC	2,745	1,788	569	265	68	55	130
Albany, N.Y.	56	44	6	1	2	3	2
Allentown, Pa.	19	15	4	-	-	-	-
Buffalo, N.Y.	113	71	28	10	2	2	17
Camden, N.J.	34	14	16	3	1	-	-
Elizabeth, N.J.	20	16	3	-	1	-	-
Erie, Pa.†	41	30	6	3	2	-	2
Jersey City, N.J.	43	25	12	3	2	1	2
N.Y. City, N.Y.	1,441	894	300	186	35	26	51
Newark, N.J.	59	32	10	10	3	4	3
Paterson, N.J.	33	19	10	1	1	2	3
Philadelphia, Pa.	398	274	83	27	9	5	24
Pittsburgh, Pa.†	80	55	15	4	3	3	2
Reading, Pa.	31	26	3	-	-	2	3
Rochester, N.Y.	119	83	27	4	3	2	10
Schenectady, N.Y.	23	18	3	-	1	1	1
Scranton, Pa.†	34	28	4	-	1	1	2
Syracuse, N.Y.	97	73	17	4	1	2	7
Trenton, N.J.	49	29	11	7	1	1	-
Utica, N.Y.	31	22	8	1	-	-	1
Yonkers, N.Y.	24	20	3	1	-	-	2
E.N. CENTRAL	2,206	1,393	495	176	60	82	83
Akron, Ohio	52	30	16	2	1	3	-
Canton, Ohio	31	22	6	2	-	1	2
Chicago, Ill.§	564	362	125	45	10	22	16
Cincinnati, Ohio	104	68	21	8	3	4	8
Cleveland, Ohio	179	104	45	22	3	5	5
Columbus, Ohio	81	45	28	4	1	3	4
Dayton, Ohio	106	67	21	10	5	3	3
Detroit, Mich.	273	155	64	28	14	12	7
Evansville, Ind.	34	22	7	1	4	-	-
Fort Wayne, Ind.	56	34	13	7	2	-	2
Gary, Ind.	12	2	6	1	2	1	-
Grand Rapids, Mich.	56	39	14	1	1	2	9
Indianapolis, Ind.	177	110	43	13	2	9	3
Madison, Wis.	34	19	5	5	2	3	3
Milwaukee, Wis.	136	100	20	7	3	6	2
Peoria, Ill.	47	35	8	2	1	1	5
Rockford, Ill.	31	22	2	3	2	2	4
South Bend, Ind.	61	41	15	3	1	1	3
Toledo, Ohio	120	80	27	8	3	2	6
Youngstown, Ohio	52	36	9	5	-	2	1
W.N. CENTRAL	782	543	146	38	28	26	35
Des Moines, Iowa	43	30	10	1	1	1	3
Duluth, Minn.	39	31	1	2	3	2	1
Kansas City, Kans.	44	29	9	5	1	-	1
Kansas City, Mo.	98	61	27	5	2	3	6
Lincoln, Nebr.	29	20	5	2	1	1	3
Minneapolis, Minn.	174	118	32	10	6	8	1
Omaha, Nebr.	95	69	19	1	3	3	7
St. Louis, Mo.	111	82	14	7	7	1	11
St. Paul, Minn.	73	52	17	3	-	1	-
Wichita, Kans.	76	51	12	2	4	6	2
S. ATLANTIC	1,160	683	247	133	41	55	44
Atlanta, Ga.	138	71	37	22	7	1	4
Baltimore, Md.	161	100	33	18	9	1	4
Charlotte, N.C.	70	44	11	10	1	4	1
Jacksonville, Fla.	103	64	26	4	5	4	4
Miami, Fla.	119	61	25	20	5	8	2
Norfolk, Va.	55	30	8	6	2	9	2
Richmond, Va.	100	60	27	10	2	1	7
Savannah, Ga.	36	19	7	6	1	3	2
St. Petersburg, Fla.	100	74	14	4	1	7	6
Tampa, Fla.	62	45	8	3	4	2	6
Washington, D.C.	191	97	48	27	4	14	5
Wilmington, Del.	25	18	3	3	-	1	1
E.S. CENTRAL	741	483	160	52	20	26	43
Birmingham, Ala.	89	62	19	-	1	7	4
Chattanooga, Tenn.	57	40	15	2	-	-	6
Knoxville, Tenn.	58	31	15	5	3	4	5
Louisville, Ky.	117	70	31	12	2	2	10
Memphis, Tenn.	192	121	39	13	10	9	9
Mobile, Ala.	71	51	16	-	1	3	2
Montgomery, Ala.	35	22	7	5	1	-	-
Nashville, Tenn.	122	86	18	15	2	1	7
W.S. CENTRAL	1,260	717	302	121	61	59	37
Austin, Tex.	53	34	8	5	3	3	2
Baton Rouge, La.	19	10	5	2	-	2	1
Corpus Christi, Tex.	33	20	9	1	1	2	2
Dallas, Tex.	211	105	50	28	12	16	2
El Paso, Tex.	44	29	10	1	2	2	2
Fort Worth, Tex.	85	50	19	5	6	5	3
Houston, Tex.	339	177	88	48	15	11	9
Little Rock, Ark.	60	35	15	4	5	1	2
New Orleans, La.	120	80	26	6	5	3	1
San Antonio, Tex.	160	88	43	11	9	9	8
Shreveport, La.	58	38	14	3	1	2	2
Tulsa, Okla.	78	51	15	7	2	3	3
MOUNTAIN	626	406	122	58	15	24	23
Albuquerque, N.Mex.	73	51	14	6	-	1	3
Colo. Springs, Colo.	38	22	7	5	2	2	7
Denver, Colo.	111	67	22	13	5	4	3
Las Vegas, Nev.	89	54	23	8	1	3	4
Ogden, Utah	22	17	3	2	-	-	1
Phoenix, Ariz.	127	81	22	15	4	5	2
Pueblo, Colo.	14	7	5	2	-	-	-
Salt Lake City, Utah	44	28	5	2	2	7	1
Tucson, Ariz.	108	79	21	5	1	2	2
PACIFIC	1,830	1,187	346	177	67	48	105
Berkeley, Calif.	24	17	4	2	-	-	3
Fresno, Calif.	83	51	12	8	6	6	5
Glendale, Calif.	24	22	1	-	1	-	2
Honolulu, Hawaii	71	48	12	7	3	1	8
Long Beach, Calif.	81	55	14	4	3	5	8
Los Angeles, Calif.	426	254	80	63	19	5	12
Oakland, Calif.	79	51	11	7	7	3	2
Pasadena, Calif.	20	16	1	2	1	-	2
Portland, Oreg.	120	78	25	11	4	2	3
Sacramento, Calif.	139	81	35	14	2	6	13
San Diego, Calif.	158	111	29	10	6	2	15
San Francisco, Calif.	153	95	34	21	2	1	3
San Jose, Calif.	190	138	30	11	3	8	16
Seattle, Wash.	170	106	42	11	8	3	5
Spokane, Wash.	53	36	11	3	1	2	6
Tacoma, Wash.	39	28	5	3	1	2	2
TOTAL	11,960††	7,618	2,502	1,060	375	395	545

* Mortality data in this table are voluntarily reported from 121 cities in the United States, most of which have populations of 100,000 or more. A death is reported by the place of its occurrence and by the week that the death certificate was filed. Fetal deaths are not included.

** Pneumonia and influenza.

† Because of changes in reporting methods in these 3 Pennsylvania cities, these numbers are partial counts for the current week. Complete counts will be available in 4 to 6 weeks.

†† Total includes unknown ages.

§ Data not available. Figures are estimates based on average of past 4 weeks.

Current Trends

North Carolina Drownings, 1980-1984

Unintentional drownings in North Carolina in the period 1980-1984 were examined using records obtained from the North Carolina Office of the Chief Medical Examiner, which investigates all deaths from intentional and unintentional injury. A total of 1,052 persons drowned in the 5-year period, 953 of whom were North Carolina residents, for an average annual crude mortality rate of 3.2 drowning deaths/100,000 residents (Table 1).

Drowning rates per 100,000 population were higher for nonwhites than for whites (4.8 vs. 2.6) and higher for males than for females (5.8 vs. 0.8). Rates were highest for nonwhite males (8.8), followed by white males (4.7), nonwhite females (1.2), and white females (0.7) (Table 1). For all race/sex groups combined, drowning rates were highest for persons ages 15-29 years (4.6/100,000) (Table 2).

Most drownings occurred in lakes or ponds (39%), rivers or creeks (29%), or oceans and bays (11%). Six times as many drownings occurred in natural settings as in constructed facilities (e.g., bathtubs, pools).

At the time drownings occurred, most victims were swimming (41%) or fishing (15%) (Table 3). Drownings among members of certain demographic subgroups and among persons

TABLE 1. Race- and sex-specific drowning rates and percentages of victims with blood alcohol concentrations ≥ 100 mg%, North Carolina, 1980-1984

	Drownings*		BAC ≥ 100 mg %†	
Race/sex of victims	Number	Rate/100,000 residents	Number positive	Percentage positive
White male	521	4.7	154/474	32.5
White female	76	0.7	13/58	22.4
Nonwhite male	309	8.8	110/275	40.0
Nonwhite female	47	1.2	6/32	18.8
Total	**953**		**283/839**	**33.7**

*North Carolina residents.

†Of 1,052 drowning victims, 839 were tested for BAC.

TABLE 2. Age-specific drowning rates and percentages of victims with blood alcohol concentration ≥ 100 mg%, North Carolina, 1980-1984

	Drownings*		BAC ≥ 100 mg%†	
Age of victims (years)	Number	Rate/100,000 residents	Number positive	Percentage positive
0-14	170	2.6	1/87	1.1
15-29	379	4.6	120/374	32.1
30-44	177	2.9	84/169	49.7
45-59	124	2.7	50/119	42.0
>60	103	2.3	28/90	31.1
Total	**953**		**283/839**	**33.7**

*North Carolina residents.

†Of 1,052 drowning victims, 839 were tested for BAC.

Drownings – Continued

with some pre-existing medical conditions showed special associations with specific activities. For example, males accounted for 98% of all fishing deaths, and females accounted for 43% of all bath-associated deaths. White males accounted for a higher percentage (82%) of other recreational deaths (e.g., canoeing, sailing) than they did for all categories of drownings (56%). Children less than 5 years of age accounted for a higher percentage (25%) of bath-associated deaths than they did for all categories of drownings (6%). Although only 7% of all drowning victims were known to have seizure disorders, persons with seizure disorders accounted for 53% of all drownings resulting from bathing in a bathtub.

Of all drownings, 56% were witnessed. However, the proportion of drownings that were witnessed ranged from 92% for swimming in a group to 3% for bathing in a bathtub. Of the 74 children ages 0-5 years who drowned, 59 (80%) were unattended. Of all persons who drowned, 2% drowned while attempting to rescue other drowning persons.

Blood-alcohol tests were performed for 839 (80%) of the 1,052 drowning victims. Alcohol was detected in 48% of victims tested; in 34% of victims tested, blood-alcohol levels were ≥ 100 mg%,* the legal level of intoxication in North Carolina. Blood-alcohol presence varied by demographic subgroup and predominated among nonwhite males (40%) and 30- to 44-year-olds (50%) (Tables 1 and 2).

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Editorial Note: Drowning is the third most common cause of unintentional injury death in the United States (*2*). Drowning rates reported for North Carolina are higher than the overall national drowning rate of 2.4/100,000 population (*1,2*). Although most surveys of drowning consist of data derived from death certificate ICD codes, the North Carolina data reported here were abstracted from medical examiner reports, which also include findings of an investigation by a county medical examiner, autopsy reports, and toxicologic studies.

Age, race, and sex groups at highest risk for drowning in North Carolina are similar to

*The level of alcohol in the blood is defined as "milligrams of alcohol per 100 milliliters of blood" and is expressed as milligrams percent (mg%).

TABLE 3. Activity-specific percentages for drownings and percentages of victims with blood alcohol concentrations ≥ 100 mg%, North Carolina, 1980-1984

Activity involving victims	Drownings*		BAC ≥ 100 mg%†	
	Number	Percentage	Number positive	Percentage positive
Swimming	435	41.3	124/358	34.6
Fishing	157	14.9	42/137	30.7
Motor vehicle crash	83	7.9	35/69	50.7
Other recreation	65	6.2	15/52	28.8
Motorboating	51	4.8	14/40	35.0
Bath-associated	40	3.8	6/31	19.4
Rescue attempt	24	2.3	4/21	19.0
All other§	197	18.7	43/131	32.8
Total	**1,052**		**283/839**	**33.7**

*All drownings reported in North Carolina during 5-year period.

†Of 1,052 drowning victims, 839 were tested for BAC.

§Most activities involved unintentional entry into a body of water such as a creek, ditch, or pond.

Drownings – Continued

those reported in national data (*1*). The proportions of North Carolina drownings occurring in lakes/ponds and rivers/creeks are similar to those reported for Georgia (*3*); however, the occurrence of drownings in natural settings relative to those in constructed facilities is proportionately higher. The proportions of drownings resulting from activities such as swimming and fishing (sometimes reported in other studies as "falling off docks or bridges") are similar to those reported from national surveys (*2*) and from other states (*3,4*).

Studies based on death certificates generally do not permit assessment of the impact of pre-existing medical conditions on drowning occurrence, because such information may not be provided in death certificates. The North Carolina data support the hypothesis that persons with seizure disorders are at higher risk for drowning than the general population (*4,5*); persons with seizure disorders are more likely to have a seizure following alcohol intoxication (*6,7*).

Because approaches to limiting the consumption of alcohol may be difficult to enforce, efforts should be made to increase public awareness of the physical impairments resulting from alcohol use which pose risks for swimmers, fishermen, and boaters. Strategies for injury prevention rely primarily on elimination of the hazard, creation of barriers between the hazard and the person at risk, instruction in personal protective measures against the hazard, and institution of measures to minimize damage associated with the hazard (*8*). In addition to human behavioral factors, intervention should focus on the modification of factors in the socioeconomic environment, as well as such factors as vehicles and equipment in the physical environment. Previous studies showed that alcohol was associated with about 50% of drownings among teenagers and adults (*4*). Enforcing limitations on the consumption of alcohol near water is difficult, although public awareness that the physical impairment resulting from alcohol use is as dangerous for swimmers, fishermen, and boaters as it is for motor vehicle operators could almost certainly be improved. Additionally, it must be realized that alcohol consumption among some high-risk individuals (e.g., 15- to 24-year-olds) is highly affected by the accessibility of alcohol. Sales and consumption of alcohol among this group are inversely related to the cost of alcohol (*9*). Recent upward alterations in the legal drinking age may lead to reductions in mortality associated with drowning.

Seventy-nine percent of North Carolina drowning deaths occurred in such natural settings as lakes, rivers, and bays. Of the 7,000 unintentional drownings that occur each year in the United States, about 17% involve boats—primarily recreational craft (*3*). Despite a 59% increase in the number of recreational craft in operation in the United States between 1973 and 1982, the recreational boating fatality rate (about 90% due to drownings) decreased 56% during the same period (*3*). Although the causes for this decrease have not been determined, they may include industry and government initiatives that have resulted in safety improvement in boats, increased use of personal flotation devices, and regulations that promote safe boating. Water safety instruction should be designed to lead to improvements in swimming ability, discourage risk-taking behavior such as alcohol use near water, encourage the use of personal flotation devices on boats, and teach rescue techniques that do not endanger the life of the rescuer. However, studies of the efficacy of water safety instruction programs are needed before such instruction is advocated as an effective intervention technique (*10*).

Although most North Carolina drownings do not occur in settings—such as pools—that could be fenced or drained when not in use, in the United States as a whole, most home-related drownings do occur in swimming pools and bathtubs. Therefore, child-proof fencing with self-latching gates around potentially dangerous bodies of water, including swimming pools, may reduce drowning among young children (*11*).

Drownings – Continued

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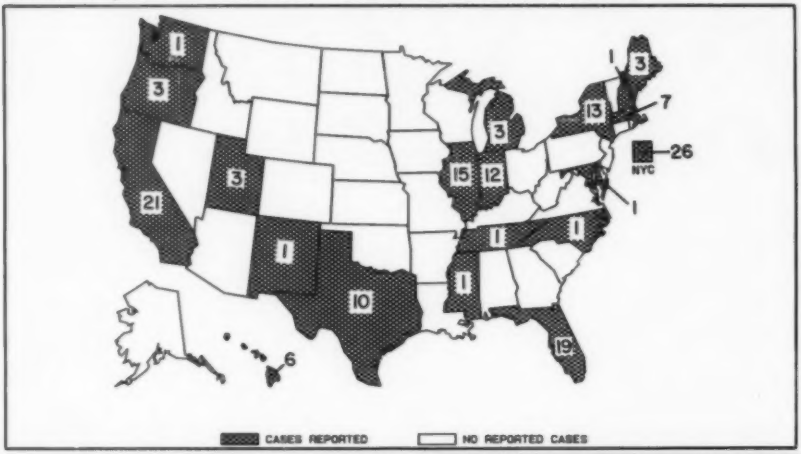
FIGURE I. Reported measles cases — United States, weeks 36-39, 1986



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The editor welcomes accounts of interesting cases, outbreaks, environmental hazards, or other public health problems of current interest to health officials. Such reports and any other matters pertaining to editorial or other textual considerations should be addressed to: ATTN: Editor, *Morbidity and Mortality Weekly Report,* Centers for Disease Control, Atlanta, Georgia 30333.

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